Space Weather Forecast

Issued on Monday, 03 April 2023 at 00:21 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Minor Geomagnetic Storms Days 1-3.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, with several small Common-class flares observed. There are currently four sunspot regions on the disc. Most are small and simple with little magnetic complexity. However, a newly emerged sunspot region in the southern hemisphere near the centre disc has grown fairly rapidly today and contains the greatest potential for notable flaring. Several Coronal Mass Ejections (CMEs) have been detected in available imagery, however analysis would suggest that none are Earth-directed.

Solar Wind / Geomagnetic Activity: The solar wind has been predominantly at Elevated levels with wind speeds of 530-580 km/s initially due to the ongoing enhancement of a fast stream from a coronal hole. This effect has reduced through the UTC day, with speeds falling back to Slightly Elevated levels (around 480km/s) by the end of 02 Apr. The important north-south component has been weakly fluctuating. Geomagnetic activity was initially Active (Kp4) but reduced to Quiet to Unsettled (Kp0-3) levels from 02/0600 UTC.

Energetic Particles / Solar Radiation: High energy proton enhancement (greater than 10MeV) has been at background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain Low, with a Slight Chance of increasing to Moderate levels.

Solar Wind / Geomagnetic Activity: Although no Earth-directed CMEs are expected, there is a very slight chance of glancing blows from one or more CMEs at Earth on Days 1 and 2 (03 and 04 Apr).

Solar winds are currently at Elevated to Slightly Elevated levels. Wind speeds are likely to become predominantly Slightly Elevated on Day 1 (03 Apr), although this may be complicated by any transitory CME impacts. On Days 2-3 (04-05 Apr) Earth is expected to connect to the high-speed stream from one or more coronal holes. Solar wind speeds are expected to return to Elevated or perhaps Strong levels and continue into Day 4 (06 Apr).

Generally Quiet to Unsettled geomagnetic activity is expected on Day 1 with a chance of Active intervals or perhaps isolated G1/Minor Storm conditions, particularly should any CME effects occur. There is an increasing probability of Active or G1/Minor Storm intervals on Day 2 due to the combined influence of coronal hole high-speed stream and possible transitory CME effects. Activity should generally ease to Unsettled levels by Days 3 and 4 with a reducing risk of Active or G1/Minor Storm conditions in the absence of any further CMEs.

Energetic Particles / Solar Radiation: No solar radiation storms are expected through the period.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	40	20	5
Strong	G3	No	1	5	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	10	15	15	15
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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